ACI News Letter

Vol. 28, No. 5 JOURNAL of the AMERICAN CONCRETE INSTITUTE November 1956

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ACI

News Letter Contents

November 1956

On the Cover—Helicoidal staircase of cast-in-place concrete graces the plaza of Mondawmin shopping center of Baltimore, Md. Spanning an illuminated pool, the stair leads from a rooftop parking area to the lower mall. More information on p. 9.

Photograph courtesy William L. Crow Construction Co.

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Mass production techniques speed prestressing work for

New Orleans Causeway

Opened to traffic 4 months ahead of schedule, the $30 million Greater New Orleans Causeway was dedicated on August 30. Representing the largest application of precast, pre-tensioned concrete construction in the world, the new structure extends north from New Orleans across Lake Ponchartrain for 24 miles.

The contractor completed the huge undertaking in just 19 months using simplified design, and assembly line methods for production of the precast prestressed parts of the bridge. Construction began on the manufacturing yard in January, 1955; 3 months later the first pile section was spun; and within 5 months of starting, the first deck slab was installed. The bridge is 33 ft wide overall, and has a two-lane roadway 28 ft wide between curbs. Two double-leaf bascules provide for passage of larger craft, while three humps will permit passage of smaller boats.

Nearly 5000 prestressed cylinder piles—average length 88 ft—were used to support the structure. Piles were manufactured and installed by Raymond Concrete Pile Co., New York.

Pre-tensioning facilities for the bridge deck members were designed by the Freyssinet Co., Inc., New York, which also supervised their construction and initial operation. Three pre-tensioning benches were made, each 490 ft long by 43 ft wide, and each capable of producing a line of eight bridge sections at one time.

Elevated rails for mechanical screeds and steam curing sheds were set along each side of the benches. A gantry crane straddled the benches. Due to poor soil conditions, both the gantry crane and the pre-tensioning benches were designed for pile supports.

The typical sequence of operations on a single pre-tensioning bench was:

Continued on p. 4

1. The ⅜-in. strands, 25 at a time, were drawn the full length of the pre-tensioning bench from a specially designed strand supply car. Each such pull supplied the full strand requirements for one of the seven vertical webs of the eight bridge sections. The strands were automatically positioned and spaced by templates. The strands were anchored at each end of the 490-ft bench. This operation was repeated until the 175 strands were placed, positioned, and anchored.

2. Seven 200-ton hydraulic jacks were used to tension the strands. All seven jacks were connected to a common control panel, thereby enabling one man to operate and synchronize them.

3. Reinforcing steel for the eight sections was placed. Stirrups were placed in each of the vertical webs. Mat reinforcement for the roadway slab, having been pre-assembled, was placed by a mobile crane. Reinforcement for the curb sections was also placed.

4. The concrete, up to the top of the roadway slabs was placed. Then the mechanical screed and the hand finishing platform followed, each spanning between the elevated rails. When the roadway concrete had set, curb forms were positioned and the curb sections placed.

5. Sheds, mounted on the elevated tracks, were used to enclose the eight bridge sections for steam curing, which accelerated the hardening of the concrete.

6. When the concrete had attained the required strength, the seven jacks were used to ease the pre-tensioning force off the bench abutments, allowing its gradual transfer into the bridge sections.

7. Forms were stripped. The traveling gantry crane lifted each section from the bench and carried it to the barge loading trestle. The barges, each carrying two bridge sections, were towed to the bridge where a water rig placed sections on pile caps.

By casting bridge sections on one of the three pre-tensioning benches every day, a daily production schedule of eight slabs or 448 ft of bridge was established.

The project was designed and construction supervised by Palmer and Baker, Inc., consulting engineers of Mobile, Ala. General contractor was the Louisiana Bridge Co., a joint venture of Brown and Root, Houston, Texas, and T. L. James and Co., Ruston, La.

Said to represent the largest application of precast, pre-tensioned concrete structure in the world is $30 million Greater New Orleans Causeway

ACI Assists in Meetings

Paul F. Rice, ACI technical director, addressed local area groups at the University of Detroit, Wayne State University, University of Kansas, and University of Wichita recently. He will also represent the Institute at the Sixth Annual Concrete Conference at the University of Minnesota, November 26-27.

Attendance for the Kansas City opening session was reported at 120. Forty persons met for the Wichita program. A report on the recent Nebraska co-sponsored meetings, addressed by Mr. Rice, will be published in the December News Letter.

University of Detroit

A local area meeting September 13 at the University of Detroit on changes in the ACI Building Code was attended by 300 engineers, architects, contractors, and concrete suppliers. The program, jointly sponsored by ACI, the Portland Cement Association, and the University of Detroit, featured discussions of changes affecting structural design by Raymond C. Reese, changes affecting testing and concrete specifications by Paul Rice, and the operation of Committee 318 by J. P. Thompson.

Particular local interest in the new ACI Building Code has been aroused since the 1951 version was incorporated by reference in its entirety in the new City of Detroit Building Code which became effective June 21, 1956. The new Detroit code, based on the National Basic Building Code, allows adoption of revision in accepted standards such as ACI 318-51 by a single annual amendment to change dates of the accepted standard.

The following three meetings in this weekly series at the University of Detroit were addressed by E. Clayton Singleton, regional structural engineer for the Portland Cement Association. Mr. Singleton's lectures dealt with ultimate strength design as permitted by ACI 318-56.

Wayne State University

A series of five weekly lectures on design of thin shell concrete structures began October 11 at Wayne State University, Detroit, sponsored by the university and the Portland Cement Association. Charles A. Keelen, PCA structural engineer, Pittsburgh, spoke at the first meeting on "Simply Supported Barrel Shells." Mr. Singleton addressed the following three sessions on: shells continuous over supports and simply supported multiple barrel shells; barrel shells with edge beams; shell reinforcement and transverse supports. A. L. Parme, PCA structural engineer, Chicago, appeared at the concluding meeting November 8—his topic, short barrel shells and hyperbolic paraboloid shells.

University of Kansas

A prestressed concrete design seminar began October 16 at the University of Kansas Extension Center, Kansas City, Kan., with an address by ACI Technical Director Paul F. Rice, "Review of the New 1956 ACI Building Code." "Application of Prestressed Concrete to Buildings and Special Design Considerations" was the topic of T. Y. Lin, professor of civil engineering, University of California, Berkeley, speaking on Oct. 23.

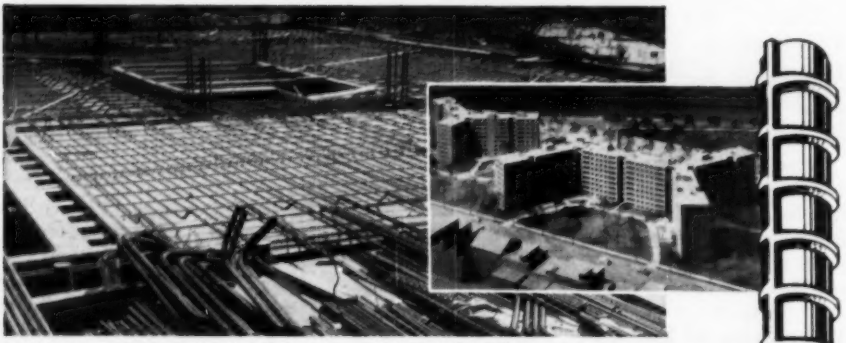
Carl O. Knop, PCA structural engineer, Topeka, Kan., dealt with "Prestressed Concrete Design Methods" on October 30. De-

REVIEWER NEEDED

Betongen Idag

This Norwegian magazine on cement and concrete is being received at ACI headquarters. A volunteer reviewer is needed to keep members informed of pertinent papers in this publication through the "Current Reviews" section of the **Journal.** Those interested should write the secretary of the Technical Activities Committee at ACI headquarters.

to Build in DURABILITY



Public Housing Project Mo. 1-6, Phase 1, providing 660 dwelling units for low-income families.

Architects: Hellmuth, Obata & Kassabaum, Inc.;
General Contractor: Millstone Construction Co.;
Engineer: William C. E. Becker. All of St. Louis.

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sign of the 138-ft span girders for a Springfield, Mo., high school was explained by Dutton Biggs, PCA structural engineer, at the concluding session November 6.

This seminar was offered by the University of Kansas Extension, in cooperation with the American Concrete Institute and the Portland Cement Association.

University of Wichita

Mr. Rice addressed a meeting in Wichita, Kan., October 17, presenting "Changes in the ACI Building Code." This session was cosponsored by ACI and PCA in cooperation with the civil engineering department of the University of Wichita.

University of Minnesota

The University of Minnesota, Minneapolis, has announced plans for its Sixth Annual Concrete Conference, Nov. 26-27, 1956. The program is sponsored jointly by the University of Minnesota and the Portland Cement Association in cooperation with ACI and other interested groups. An opening session on lightweight concrete will be addressed by G. W. Washa, University of Wisconsin, Madison; Cedric Willson, Expanded Clay and Shale Products Association, Houston, Texas; and Robert Nystrom, Naugle-Leck Co., Minneapolis.

Prestressed members for buildings will be treated by E. E. Edwards, Leap, Inc., Lakeland, Fla. George Bishop, assistant chief engineer for the Illinois Toll Roads Commission, will discuss prestressed bridges on the toll road. "New Concepts in Concrete Design" will be the topic of Milo Ketchum, Jr., consulting engineer, Denver.

Norman Henning, Twin City Testing & Engineering Laboratories, St. Paul, Fred Mc Comb, PCA district engineer, Minneapolis, and Admiral John Manning, New York, are scheduled for the November 27 program; John King, Intrusion-Prepakt, Cleveland, will address a luncheon meeting November 27, and the afternoon following will be devoted to sectional meetings. Paul Rice, ACI Technical Director, will discuss ready-mixed concrete for this portion of the conference. Other speakers at the sectional meetings include Ken Clark, Minneapolis structural engineer, and John Banker, Portland Cement Association, Chicago.

LOOKING AHEAD

November 12-19, 1956—8th Annual Convention, American Concrete Pressure Pipe Assn., Castle Harbour Hotel, Tucker's Town, Bermuda

November 27-30, 1956—American Association of State Highway Officials, Annual Meeting, Traymore Hotel, Atlantic City, N. J.

November 27, 1956—Annual Dinner, American Institute of Consulting Engineers, Waldorf Astoria Hotel, New York, N. Y.

December 6-7, 1956—Illinois Institute of Technology Modern Builders Conference, Prudential Building, Chicago, Ill.

January 7-11, 1957—Highway Research Board, Annual Meeting, Sheraton-Park Hotel, Washington, D. C.

January 15-17, 1957—National Crushed Stone Association, 40th Annual Convention, American Hotel, Miami Beach, Florida

January 28-31, 1957—Plant Maintenance and Engineering Show, Public Auditorium, Cleveland, Ohio

January 28-February 2, 1957—American Road Builders' Association, Road Show and 55th Annual Convention, International Amphitheater, Chicago, Ill.

February 11-14, 1957—National Sand and Gravel Association, 41st Annual Convention, Statler Hotel, Los Angeles, Calif.

February 11-14, 1957—National Ready Mixed Concrete Association, 27th Annual Convention, Statler Hotel, Los Angeles, Calif.

February 25-28, 1957—American Concrete Institute, 53rd Annual Convention, Statler Hilton Hotel, Dallas, Texas

February 25-28, 1957—National Concrete Masonry Association, 37th Annual Convention and Concrete Industries Exposition, Kiel Auditorium, St. Louis, Mo.

March 6-9, 1957—American Concrete Pipe Association, 48th Annual Convention, Shoreham Hotel, Washington, D. C.

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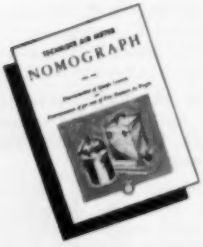

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Mondawmin Shopping Center's

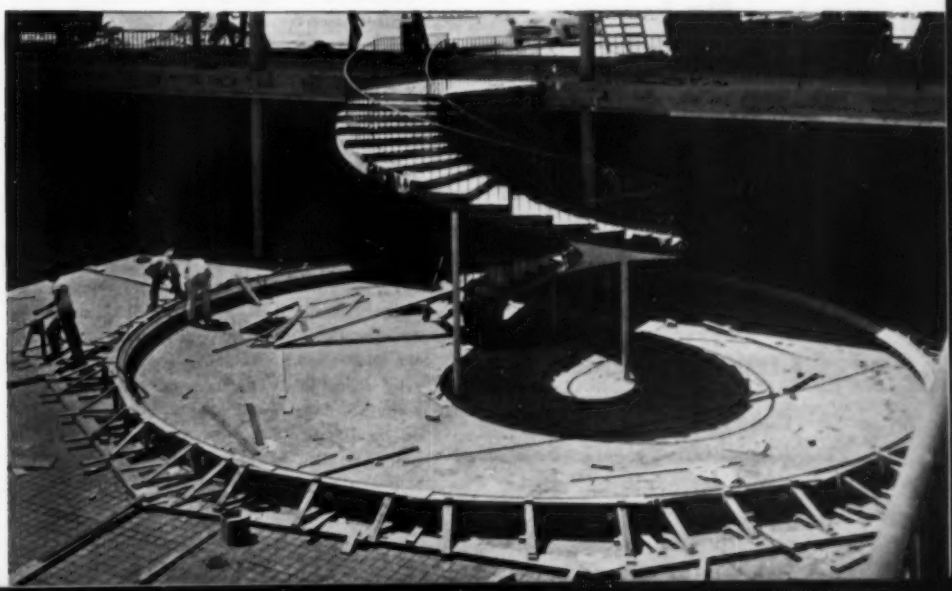
Circular Staircase

Unusual feature of Baltimore's Mondawmin shopping center is a cast-in-place concrete circular staircase which connects a rooftop parking area with the lower mall. The recently opened shopping center includes 500,000 sq ft of shopping area plus parking space for 4100 automobiles, of which 5½ acres will be on the roofs of lower-level shops. (See also News Letter cover.)

The staircase is 18 ft in diameter, with stair treads 5 ft wide with an inner radius of 4 ft. The stair is of helix design and cantilever construction with a 315 deg turn; there are 26 risers with a total vertical rise of 14 ft. Forms (right) for the structure were built by the Green Staircase Co. of Philadelphia.

Concrete for both the stair and reflecting pool is a 7-bag mix, using white cement and white aggregate—39 percent white sand and 61 percent white limestone chips. After 28 days it tested 4515 psi. Forms were left in place for several weeks during curing. Photograph below shows stair before clean-up with some of the laminated forms still in place.

Dan Kiley, Charlotte, Vt., designed the staircase; architects for the development are Fisher, Nes, Campbell and Associates, Baltimore. William L. Crow Construction Co., New York, is the general contractor for Mondawmin shopping center.



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Bridge and highway engineers needed

Announcement has been made of civil service examinations for bridge engineer and highway engineer, principally for duty with the Bureau of Public Roads of the Department of Commerce. Positions are in Washington, D. C., and throughout the United States, with salaries ranging from $5335 to $8990 annually. Detailed information is available in announcements No. 70B and 71B of the United States Civil Service Commission. Applications should be made to Executive Secretary, Board of U. S. Civil Service Examiners, Bureau of Public Roads, Department of Commerce, Washington 25, D. C.

Bureau of Reclamation seeks engineers

An open competitive examination for positions in all branches of engineering has been announced by the U. S. Civil Service Commission; placement of appointees will be in the western states and Alaska with the Bureau of Reclamation. Entrance salaries range from $4480 to $6115 annually, and a written test will be required of applicants who have not completed a full 4-year program engineering curriculum. Details are contained in announcement No. 10-1-6 (56).

Applications will be accepted by the Central Board of U. S. Civil Service Examiners, Bureau of Reclamation, Denver Federal Center, Denver, Colo.

ARBA announces 1957 convention program

Program for the American Road Builders' Association convention, Jan. 28-Feb. 2, 1957, at the International Amphitheater, Chicago, has been announced. Technical sessions on road work will include discussions on rigid-type pavement design and slip-form paving, superhighway planning, highway lighting, construction practices, and winter maintenance. The ARBA Road Show, first staged in 9 years, will feature the products of some 250 equipment manufacturers; another 40 producers of highway products will participate in a materials and supplies exhibit.

Folded plate roof selected for low-rent housing project in Atlanta, Ga., extends fireproof construction through the roof line, in contrast with usual practice of using trussed wooden rafters for roof support. The slabs are exposed on the underside; sloping elements produce a pleasing effect, in addition to giving an impression of spaciousness

Atlanta housing project uses folded plate roof

By I. E. MORRIS*

In designing an Atlanta housing project (GA. 6-7) which involved 76 buildings approximately 26 ft wide with 510 residence units, the architects departed from the usual practice of constructing the roofs of trussed wooden rafters, which had been more or less standard practice locally. The practice of using fireproof materials from footings to eaves, and then switching to combustible materials seemed to be illogical and unnecessary. Consequently, for this project, the problem was to design a concrete roof which would cost about the same as a roof of trussed wooden rafters.

Cost comparisons indicated that a folded plate would be more economical than either a flat concrete plate or a beam and slab system. A ribbed slab was not considered because it would require a ceiling to obtain a satisfactory appearance.

Since support for the roof was available along the exterior walls, the folded plates, with a thickness of 4 in. and a fold depth of 2 ft, were designed as hipped frames to span in the 26 ft direction. The lateral thrusts are transmitted through the sloping elements to tie-beams, which are placed directly above masonry walls dividing the structures into

*Member American Concrete Institute, Consulting Engineer, Morris, Boehmig & Tindel, Atlanta, Ga.

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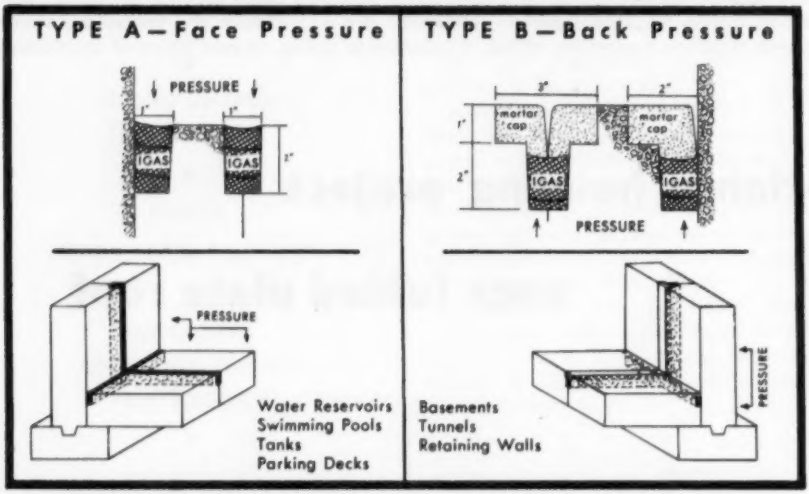

Joint sizes and types shown here are suitable for most jobs. Type A joints will sustain a 20 foot head of water with movement in the joint of 1/8". Type B joints will sustain a 20 foot head of water with movement in the joint of 1/16". Other joint details are available for special problems involving greater movement and greater water pressure.

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Staggered effect of folded plate roof of low-rent housing project in Atlanta relieves an otherwise austere silhouette

residence units. The spacing of the tie-beams varies from 33 to 40 ft.

It was found that the transverse moments were small enough to permit the use of wire mesh reinforcement. Reinforcing bars are used primarily in the tie-beams, in continuous lintels along the exterior walls, and as diagonal tension reinforcement.

The small amount of reinforcement and concrete required, plus the greatly reduced cubage resulting from the folded slab design, proved to be economical in addition to providing fully fireproof buildings.

Architects for the project were Toombs, Amisano, and Wells and Abreu and Robeson of Atlanta. Structural consultants were Morris, Boehmig, and Tyndel, also of Atlanta. The general contractor was Byck-Worrell Construction Co., Atlanta and Savannah.

. . . honor the construction man

Would your construction job form the basis of an ACI **Journal** paper? Every job superintendent or project engineer keeps a daily account of his job as a regular part of it. Why not use those daily reports, with a few regular progress photos, as the basis for a description of how your firm handles everyday and unusual concreting problems?

Good descriptions of construction projects, or interesting phases of construction projects, are eligible for the ACI Construction Practice Award. One reason for establishing the award in 1944 was to ". . . honor the construction man—the man whose resourcefulness comes in between the paper conception and the solid fact of a completed structure." Another was to enrich the literature of the construction field. The award is given for a construction paper of outstanding merit in the latest **Journal** volume.

Your paper may be the paper of "outstanding merit" in the next **Proceedings** volume.

Positions and Projects

Metal supports covered by Detailing Manual

"Recommended Practice for Use of Metal Supports for Reinforcement (ACI 319-42)" has been dropped as an Institute Standard, since it is out of date, and the same material is covered currently by the "Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI 315-51)." This latter standard is under continuous study by ACI Committee 315, and the subject of metal supports for reinforcement now comes under the jurisdiction of that committee.

Contractors predict 10-year construction trend

The nation's construction volume of all types may reach nearly $78 billion annually by 1956 under prevailing peacetime conditions, the Associated General Contractors of America stated at its midyear meeting of the governing and advisory boards in Milwaukee recently. An increase of 30 percent over the present $60 billion volume is based on a study of construction trends by a special committee on material supply headed by Charles B. Solomon, Boston.

The AGC study estimated a 32 percent increase in the need for portland cement by 1965, from 343,660,000 barrels to 453,749,000 barrels, annually. An anticipated 3,033,000 tons of reinforcing bars will be required, a 32 percent increase over present needs.

Crosier appointed to UNESCO commission

Clayton M. Crosier has been appointed by Secretary of State Dulles to the U. S. National Commission for UNESCO (United Nations Educational, Scientific and Cultural Organization). Mr. Crosier, associate professor of civil engineering at the University of Kansas, Lawrence, is chairman of the Kansas Commission for UNESCO.

Tuthill to California

Lewis H. Tuthill, for many years a concrete engineer with the U. S. Bureau of Reclamation, has resigned to assume duties as concrete engineer of the California State Department of Water Resources, Division of Design and Construction. First unit in California's over-all water conservation program will be the Feather River Project.

Mr. Tuthill is a member of the Institute's Board of Direction, the Technical Activities Committee, ACI Committee 213, and heads Committee 604, Winter Concreting Methods. He is also a member of technical committees 605, Hot Weather Concreting; 609, Compaction of Concrete by Mechanical Means; and 621, Aggregates.

Cordon to Utah State faculty

William A. Cordon has joined the civil engineering faculty, Utah State Agricultural College, Logan, where he will be in charge of the materials laboratory. A former research engineer for the Portland Cement Association, Mr. Cordon is chairman of ACI Committee 613, Recommended Practice for Proportioning Concrete Mixes, and also heads Committee 214, Evaluation of Results of Compression Tests of Field Concrete.

Murphy awarded distinguished professorship

Dr. Glenn Murphy, professor and head of the theoretical and applied mechanics department at Iowa State College, Ames, has been awarded the Anson Marston Distinguished Professorship in Engineering at the college. Dr. Murphy, who received his PhD at Iowa State in 1935, has been an ACI member since 1930.

Nordberg joins Azbe Corporation

Azbe Corp., consulting engineers of St. Louis, have announced the appointment of Bror Nordberg as vice-president. Mr. Nordberg was formerly editor of *Rock Products*.

Marion, Indiana Sewage Treatment Plant. Engineer—Consoer, Townsend & Associates, Chicago, Illinois; Contractor—Steigerwald & Borchert, Milwaukee, Wisc.

Temple Isaiah, Los Angeles, Calif. Archt.—Kenneth N. Lind, A.I.A.; Struc. Engr.—Brandow & Johnston; Contr.—Zimmer Construction Co.; Sub Contr.—Vagtborg Construction Co.—all of Los Angeles, Calif.

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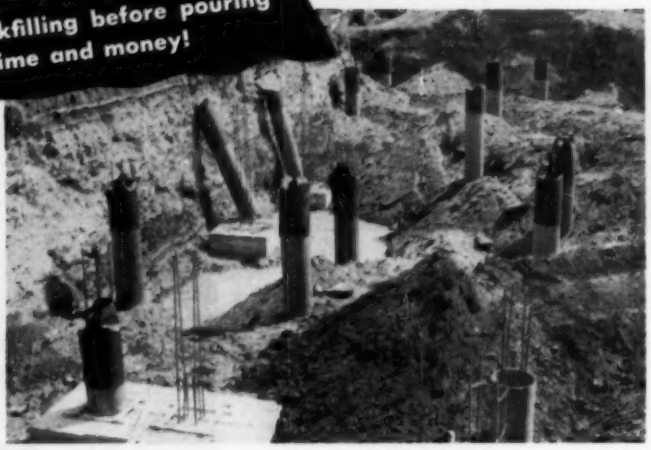

St. Marks Evan. Luth. Church, St. Paul, Minn. Sheehy Constr. Co., contractors. Albert Plagens, Architect

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Roberts will supervise foreign operations

Harrison H. Roberts has been appointed to the newly-created position of manager, engineering and foreign operations, for Intrusion-Prepakt, Inc., Cleveland. Mr. Roberts was formerly chief engineer for Walsh Canadian Construction Co., working on excavation for the St. Lawrence Seaway Authority.

Peerless opens new Detroit plant

Production is now under way at the new Peerless Cement Corp. plant in Detroit. Estimated annual output of 1,250,000 barrels will raise the company's production total to more than 6,000,000 barrels annually.

Home-made slip-forms for irrigation ditches

Wyoming farmers in Goshen County are saving time, money, and water with concrete-lined irrigation ditches, according to a report in the *Farm Journal*. Farmers built their own slip-forms and rented them through soil conservation districts. The five sizes of forms range from a small one that lines field ditches 12 in. deep, to a big, self-propelled form that lines irrigation canals 3½ ft deep.

VDI lectures on stress measurement

The Verein Deutscher Ingenieure committee on measuring and testing and the committee on engineering construction methods sponsored a series of lectures in Frankfurt a. M., Germany, on stress measurement in concrete structures. Under the leadership of Prof. H. Ebner, Mulheim, the following spoke at the October 19 meeting: G. Weil, Stuttgart; R. Kuhn, Munich; C. Rohrbach, Berlin; H. H. Emschermann, Berlin; G. Mittelmann, Frankfurt a. M.

Price Brothers expands

Concrete pressure pipe from 16- to 54-in. diameter and larger will be manufactured by Price Brothers in a new plant recently opened at Hattiesburg, Miss. Price Brothers, with headquarters in Dayton, Ohio, has other plants in Detroit and Miami, and Dayton, Cleveland and Columbus, Ohio.

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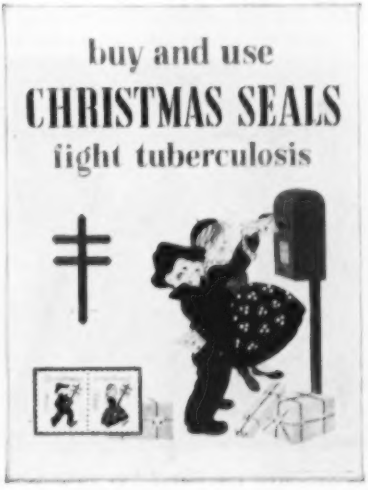
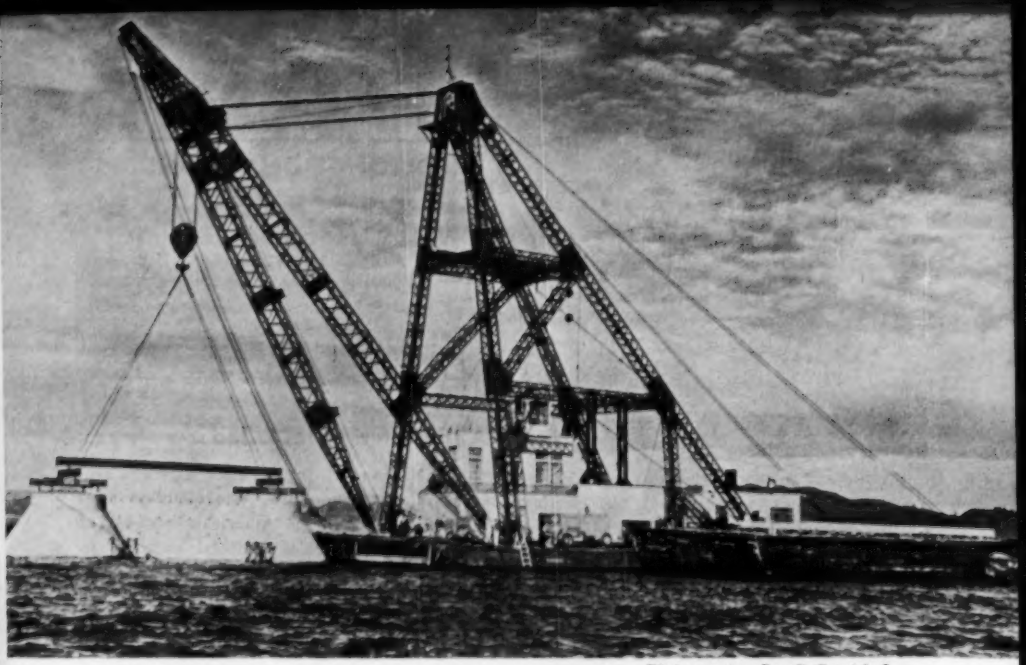
ASCE officers installed

Francis S. Friel, president of Albright and Friel, Inc., Philadelphia, was installed as a vice-president of the American Society of Civil Engineers at its annual meeting in Pittsburgh recently. An ACI member, Mr. Friel is the immediate past president of the American Institute of Consulting Engineers and is chairman of the United States Committee on Large Dams of the International Commission on Large Dams.

Other Institute members installed by ASCE are: Howard F. Peckworth, director, District 8; and Randle B. Alexander, Director, District 15. Mr. Peckworth is managing director, American Concrete Pipe Association, Chicago, and Mr. Alexander is with the Texas Highway Department, Austin.





Photos courtesy Ben C. Gerwick, Inc.

The "Pacific Atlas" places cone-diaphragm unit weighing 130 tons on top of precast ring resting on concrete grid base. Hollow precast shafts were next placed on top of each cone unit, and tremie concrete placed to an elevation of about 5 ft above water

'Bell Bottom' Piers from

for San Rafael-Richmond Bridge,

Workmen arrange forms for casting one of the 1 ft thick base grids. The H-shaped form inserts being positioned by workers are collapsible and for reuse

In the foreground is a cone-diaphragm unit for the San Rafael-Richmond Bridge piers; just behind it are several of the base grids described in the accompanying text. Not shown is intermediate assembly unit of the pier, a cylindrical form or ring, which was placed on top of each base grid. The cone-diaphragm unit was then placed atop two of the rings

Precast Concrete . . .

San Francisco Bay

Recently completed, the San Rafael-Richmond bridge spanning 4 miles of the northern part of San Francisco Bay has a substructure featuring the use of precast concrete structural units filled with tremie concrete, and underwater steel piles of great length. Because of foundation conditions, "bell-bottom" type piers were specified for the 79 bridge supports. The piers are supported by long steel H-piles.

In general, the scheme adopted was the division of each pier into several structural units. Each unit consists of a precast concrete shell 8 in. thick, containing the permanent pier reinforcing steel. After setting, the whole is filled with tremie concrete to tie the units together and to provide the bond for the reinforcing steel splices between the units.

One major problem facing the contractor was the twofold requirement that the steel H-piles be entered through a template at the elevation of the pier base, and that the pier base be rigidly supported during initial concreting operations. After extensive tests had demonstrated that high bond could be obtained under field conditions between tremie grout and steel piles, and between tremie grout and precast concrete, the pier base itself was designed as a precast concrete grid 1 ft thick, with H-slots.

Three McKiernan-Terry single-acting hammers were used for pile driving operations. The first piles driven were timber falsework driven under water and cut off to the exact grade of the pier base. The concrete grid was set in place on them. Steel piles were guided into place by a diver through the H-slots of the grid, and when they had been driven the slots were filled with grout. Vertical piles were driven first and grouted into the grid; then the batter piles were driven and grouted. Maximum pile length was 201 ft. This pier base then served as a support for the upper precast concrete units and the tremie concrete fill as it was being placed.

The $14 million contract for the substructure was completed by joint venturers Ben C. Gerwick, Inc., and Peter Kiewit Sons Co.

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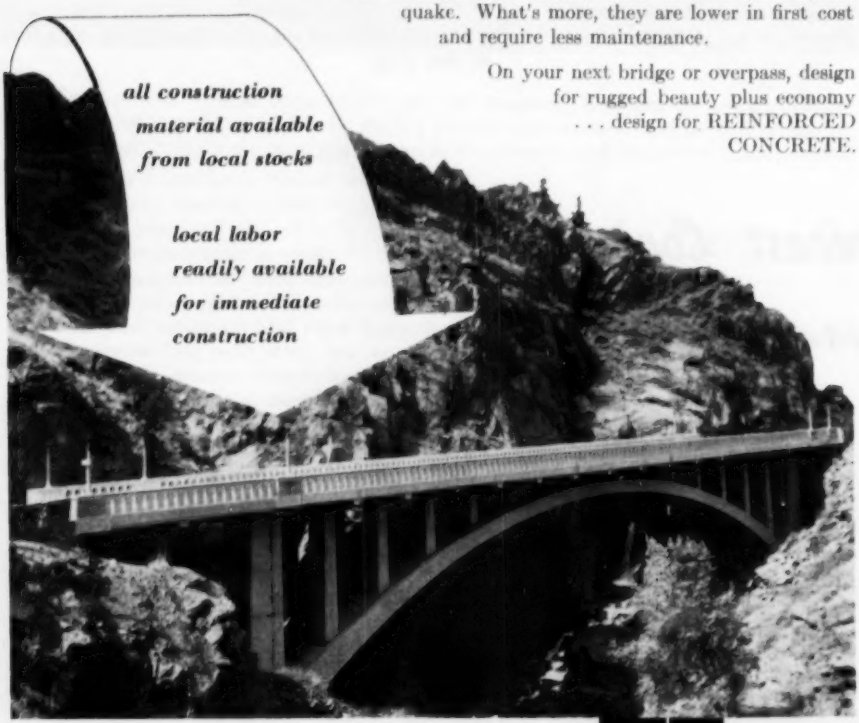

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Who's Who This Month

Subcommittee II, ACI Committee 325

"Considerations in the Selection of Slab Dimensions," reported by Subcommittee II, ACI Committee 325, appears on p. 433 of this month's JOURNAL. Head of the subcommittee is A. T. Goldbeck, engineering consultant, National Crushed Stone Association, Washington, D. C. J. A. Bishop, U. S. Naval Civil Engineering Research and Evaluation Laboratory, Port Hueneme, Calif.; L. M. Arms, Portland Cement Association, Chicago; and Robert Horonjeff, University of California, Berkeley, are subcommittee members. Also active on the subcommittee are: L. A. Palmer, Bureau of Yards and Docks, U. S. Navy, Washington, D. C.; F. N. Wray, Highway Research Board, Washington, D. C.; and Joseph H. Moore, Pennsylvania State College, State College, Pa.

Charles S. Whitney and Edward Cohen

A "Guide for Ultimate Strength Design of Reinforced Concrete," p. 455, has been prepared by Charles S. Whitney and Edward Cohen.

Mr. Whitney, a past president of the Institute, and a partner in the engineering firm of Ammann and Whitney, New York and Milwaukee, scarcely needs introduction to JOURNAL readers. An ACI Member since 1920, he is known for his contributions to shell and arch design in concrete, and for his work in ultimate load design. Long active in affairs of the Institute, he twice received the Wason Medal, and in 1951 was accorded the Alfred E. Lindau Award "in recognition of his many contributions to reinforced concrete design practice."

Following his graduation from Cornell University, he held positions with Gustave Lidenthal, New York, and as assistant engineer with John Parkinson, architect, Los Angeles. After serving in the Corps of Engineers in World War I, he was chief engineer for A. C. Eschweiler, architect, Milwaukee, and chief engineer and manager of the Milwaukee office of Hool and Johnson. Since 1922 he has been in private practice as a designing and consulting engineer. He has twice been awarded the Fuertes Graduate Medal of Cornell University and also received the J. James R. Croes Medal from the American Society of Civil Engineers.

Edward Cohen, designing engineer with Ammann and Whitney, received his engineering degrees from Columbia University where he was awarded the Illig Medal in Applied Science. Between 1940 and 1949, Mr. Cohen was engaged in design of expressways, bridges, and industrial structures, with governmental and consulting engineering offices. In 1949 he joined the Ammann and Whitney staff where his design work has included auditoriums, hangars, bridges, and special structures; more recently he has specialized in design and research on blast-resistant structures.

An ACI member since 1951, Mr. Cohen is also a member of ASCE and Tau Beta Pi.

C. C. Carlson

C. C. Carlson, manager of the Portland Cement Association's fire research center in Chicago, has prepared "Lightweight Aggregates for Concrete Masonry Units" for readers this month (p. 491). Mr. Carlson has been engaged in development work for PCA since 1935, and has supervised many projects directed toward new and improved uses of concrete and concrete construction. In 1946 he was appointed manager of the then-new structural development section, and later was manager of the products and application section of PCA. He assumed his new duties last June, and now is designing facilities for and forming the organization of the fire research center.

Mr. Carlson has served for some years on ACI Committees 213 and 716. He received the Wason Medal with R. E. Copeland in 1939 for work reported in their paper, "Tests of the Resistance to Rain Penetration of Walls Built of Masonry and Concrete."

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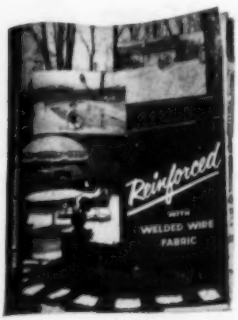

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R. C. Valore, Jr.

"Insulating Concretes," p. 509, is the work of R. C. Valore, Jr., and is the final installment of the four-part series on lightweight concrete. Now director of research and development for the engineering department of the concrete division of Texas Industries, Inc., Dallas, Mr. Valore is a graduate of North Dakota State Teachers College. He received his MA degree from New York University in 1938, and then joined the concreting materials section of the National Bureau of Standards where he was engaged in research activity until 1948. In 1948 he transferred to the structural engineering section of the building technology division at NBS where he worked until assuming his present position.

The Wason Medal for "the most meritorious paper" was presented to Mr. Valore in 1954 for his JOURNAL contribution, "Cellular Concretes."

A. M. Lount

"Prestressed Bridge Designed for Crane Load at Niagara River Weir," p. 533, is the contribution of A. M. Lount, consulting engineer and partner, T. O. Lazarides, Lount and Partners, Toronto. A graduate of the University of Toronto in 1946, he joined the Hydro-Electric Power Commission of Ontario, and in 1947 became structural engineer for the consulting engineering division of Ontario Hydro, where he first worked with prestressed concrete with E. P. Muntz. During this time he was responsible for the development of prestressed roof joists, one of the first applications of prestressing in Canada.

Mr. Lount assumed his present position in 1953. His firm has been responsible for the design of a large number of prestressed concrete structures, and has developed the work of Dr. Lazarides in the field of multi-connected indeterminate structures.

Mr. Lount is also active in an administrative capacity with Federated Consultants, Ltd.; he is a member of the Engineering Institute of Canada and the Association of Professional Engineers of the Province of Ontario. He has been an ACI member since 1950.

B. J. Butcher and H. J. Hopkins

B. J. Butcher and H. J. Hopkins are the authors of "Particle Interference in Concrete Mixes," p. 545. Mr. Butcher graduated in engineering from Canterbury University College, Christchurch, New Zealand, in 1952, and did graduate study on the workability of concrete, for which he was awarded the BE degree with honors. In 1953 he joined the design staff of the New Zealand Ministry of Works, and has since been transferred to the supervising staff of the same organization.

Professor Hopkins is head of the department of civil engineering and dean of the faculty of engineering at Canterbury University College, Christchurch. A 1934 graduate of the University of Western Australia, he later received a master's degree in engineering science at Oxford University. A Rhodes Scholar, Professor Hopkins engaged in research on relaxation methods before joining the bridge department of the Southern Railway, England.

Following service with the Royal Air Force in World War II, he was employed as a structural engineer, and then in 1948 returned to the University of Western Australia as senior lecturer in civil engineering. He assumed his present duties in 1951. In 1953 he received the Fulton Gold Medal of the New Zealand Institution of Engineers for a paper, "Modern Trends in Concrete and Reinforced Concrete."

Errata

The following correction should be made in "An Expression for Creep and Its Application to Prestressed Concrete," by Cevdet Z. Erzen, in the August JOURNAL.

p. 211—Third line, k/t should read K/t.

* * *

The following correction should be made in "Theory of the Stresses Induced in Reinforced Concrete by Applied Two-Dimensional Stress," by Bruce H. Falconer, in the September JOURNAL.

p. 280—In Fig. 2, angles labeled γ and $\pi/2 - \gamma$ should be α and $\pi/2 - \alpha$, respectively.

Membership in the American Concrete Institute

To facilitate prospective members in joining the Institute, membership application forms are provided. Present Members may aid by bringing these forms to the attention of those who may profit from membership advantages. The grades of membership are described overleaf.

All who have an interest in concrete are eligible for membership.

Members have at hand in Institute publications the most complete fund of knowledge on concrete. The ACI JOURNAL provides them with the latest information and ACI special publications provide them with the complete picture of specific problems. Through conventions, and regional and area meetings they are afforded the opportunity of meeting those whose experiences provide the new information, and of exchanging ideas with them.

Opportunity for service is present in technical committee activity, in contributions, or only comments, to the ACI JOURNAL, or in reviewing technical publications for material of interest to the membership.

ACI's world-wide membership is growing in extent and participation—traveling a common road toward better, more economical and durable concrete structures. ACI provides a common ground in the search for and use of new "working tools" in concrete design, manufacture, and erection—and its interpretation.

(cut here)

Board of Direction, American Concrete Institute
18263 W. McNichols Road
Detroit 19, Michigan

Date _____

Individual Members (U. S. and Possessions, Canada, Mexico, Central America, and West Indies)	$15.00
Individual Members (All other foreign countries)	12.00
Corporation Members	50.00
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Junior Members—nonvoting (under 28)	7.50
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(Subject to stipulations of Bylaws—Article I on reverse side. Bylaws on request.)

Of the annual dues, $12.00 is for the JOURNAL of the American Concrete Institute (except that dues for Junior and Student Members apply in full for the JOURNAL).

The undersigned hereby applies for _____ **membership**
(Individual, Corporation, Contributing, Junior, Student)

in the American Concrete Institute. Proposed by _____

For Corporation Membership, ACI representative will be _____

_____ _____
(Date of graduation if Student) (Name, if Corporation)

Signature _____

For our records, please complete both sides of application.

EXCERPTS FROM BYLAWS: ARTICLE I—MEMBERS

Section 1. This Institute shall consist of Members, Corporation Members, Contributing Members, Junior Members, Student Members, and Honorary Members interested in furthering the Institute's objects as set forth in its Charter.

Sec. 2. A Member shall be an individual. A Corporation Member shall be a firm, corporation, society, agency of government or other organization. A Corporation Member shall name one individual as its representative who will enjoy all membership rights and privileges.

A Contributing Member shall be an individual, firm, corporation, society, agency of government, or other organization wishing to give larger support to Institute activities through the payment of larger dues. Contributing Members, other than individuals, shall name representatives as do Corporation Members.

A Junior Member shall be a person less than 28 years old.

A Student Member shall be less than 28 years old and a student in residence at a recognized technical or engineering school.

An Honorary Member shall be a person of eminence in the field of the Institute's interest, or one who has performed extraordinarily meritorious service to the Institute.

Sec. 3. All classes of Members except Honorary Members and Student Members, shall be proposed by at least one Member of the Institute and elected by a two-thirds vote of the Board of Direction. An Honorary Member shall be elected by unanimous vote of the Board of Direction. A Student Member shall be proposed by a member of his school's faculty, who need not be a Member of the Institute, and elected by a two-thirds vote of the Board of Direction.

Sec. 4. All Members shall have all rights and privileges of membership as determined by the Board of Direction except that a Junior or Student Member shall not vote nor hold office. The status of a Student Member shall change automatically to that of Junior Member on the first anniversary of his membership succeeding the date on which he ceases to be a student in residence. The status of a Junior Member shall be changed to that of Member on the first anniversary of his membership after he becomes 28 years of age.

Sec. 5. Applications for and resignations from Membership and requests for change of representatives of Corporation or Contributing Memberships shall be presented in writing to the Secretary-Treasurer. Resignations may be accepted only from Members whose dues are not more than 60 days in arrears, except by special action of the Board of Direction.

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Honor Roll

February 1—September 30, 1956

First and second place remain the same this month with Jose L. Capacete with 33 credits and Federico Barona de la O with 10. Walter E. Fisher, who proposed 8 new members, is now tied for third place with W. H. Armstrong and James A. McCarthy.

Be an ACI booster . . . .

The new member YOU propose may bring important information to ACI, and certainly ACI will give generously to him from its reservoir of technical data.

Jose L. Capacete	33
Federico Barona de la O	10
W. H. Armstrong	8
Walter E. Fisher	8
James A. McCarthy	8
Phil M. Ferguson	7
Newlin D. Morgan, Jr.	7
S. E. Acker	6
Jacob J. Creskoff	6
Martin J. Gutzwiller	6
George F. Bishop	5
George M. Brief	5
J. W. Kelly	5
L. M. Legatski	5
H. C. Pfannkuche	5
Harry C. Saxe	5
George L. Blanchard	4
Arthur N. L. Chiu	4
Samuel Hobbs	4
Ignacio Martin B.	4
Ellis S. Vieser	4
Koker Al-Asady	3
W. S. Burke	3
Daniel M. Cashdan	3
M. A. Craven	3
E. L. Howard, Jr.	3
J. E. Jellick	3
Masatane Kokubu	3
Gene M. Nordby	3
Constantin Polidoroff	3
Melchor Rodriguez C.	3
C. H. Scholer	3
K. E. Whitman	3
Mihran S. Agbabian	2
G. W. Bernard	2
S. L. Burns	2
T. J. Cavanagh	2
Howard F. Christensen	2
Miles N. Clair	2
Anthony J. Costanza	2
W. S. Cottingham	2
Claudio Creamer G.	2
Clayton M. Crosier	2
Roger D. deCossio	2
Jaime de las Casas	2
James N. DeSerio	2
Julius Dorfman	2
William M. Dreisig	2
William J. Eney	2
Gordon P. Fisher	2
Donald R. Frost	2
J. Guillermo Galvan	2
Gerald K. Gillan	2
Myle J. Holley, Jr.	2
H. N. Howe	2
M. W. Huggins	2
Henry L. Kennedy	2
Fazlur R. Khan	2
Stanley Kresky	2
M. H. Kubba	2
Federico Leon	2
Arthur A. Levison	2
John B. McConville	2
R. H. Mahimtura	2
George T. Mahoney	2
Elbert Drew Mayes	2
L. J. Meszaros	2
A. F. Moore	2
Chia Muktabhant	2
Henry L. Neve	2
Adrian Pauw	2
Abdur-Rahman S. Rasul	2
Leo E. Rivkind	2
Salvador Rodriguez	2
C. W. N. Sexton	2
Theodore Sheafer	2
Max Sittenfeld	2
Mandrup Skeie	2
Floyd O. Slate	2
Murray Slater	2
Delbert Smith	2
G. B. Southworth	2
Ralph E. Spears	2
John Steinbrugge	2
L. J. Sullivan	2
Emin Veral	2
Joseph J. Waddell	2
Byron P. Weintz	2
Thomas J. Whitten	2

Next Month

- Detailed coverage of ACI's Ninth Regional Meeting, held Oct. 23-25, in Montreal, Canada . . . Including summary of each paper presented

- Prevue of upcoming 53rd Annual ACI Convention slated for Feb. 25-28, 1957, in Dallas, Texas . . . Site being glamorous, 21-story, Y-shaped Statler Hilton Hotel

New Members

The Board of Direction approved 100 Individual applications, 5 Corporations, 18 Juniors, and 5 Students. Considering losses due to deaths, resignations, and nonpayment of dues the total membership on October 1, 1956, was 8134.

Individual

ANDERSON, DELBERT B., Denver, Colo. (Sales and Service Engr., Great Western Aggregates Co.)
ANDERSON, GENE E., Tucson, Ariz. (Civil Engr.)
ANGULO, JUAN, Lima, Peru (Civil Engr., Constr. & Design, Grana y Montero S. A.)
ARANA CISNEROS, VICTOR, Lima, Peru (Struct. Engr., Techo Rex S. A.)
ARUP, OVE, London, England (Civil Engr.)
BACA, CARLOS LABARTHE, Lima, Peru (Prof. Struct. Engr., National Univ. of Engineers)
BEANO, SAID Y., Cheyenne, Wyoming (Chf. of Bridges Div., Ministry of Public Works, Amman, Jordan)
BECERRA, JULIO, Lima, Peru (Mgr., Becaiia-Marsano S. A., Contrs. & Engr.)
BELL, JOHN, Toronto, Ont., Canada (Struct. Engr., R. M. Scrivener, Cons. Engr.)
BELLOWS, K. C., Bismarck, N. Dak. (Pres. & Gen. Mgr., Western Concrete Products, Inc.)
BORSHEIM, GEORGE, Williston, N. Dak. (Borsheim Builders Supply, Inc.)
BOZZO CH., MIGUEL, Lima, Peru (Designer, Ministerio de Fomento y Obras Publicas, Prof. of Struct. Engrg., Universidad Nacional de Ingenierio)
BOCK, CARL V., Cedar Rapids, Iowa (Struct. Engr., Iowa Steel & Iron Works)
BRANDON, E. S., Sante Fe, N. M. (Chf. Struct Engr., W. C. Kruger & Assoc.)
BRENNAN, JAS., Scarboro, Ont., Canada (Asst. to Chf. Engr., B. Perini & Sons Canada, Ltd., Toronto)
BRILL, SIDNEY, Atlanta, Ga. (Engr., E. Jack Smith, Contr.)
BRINGIS, PETER R., Lexington, Ky. (Engr., Designer, Howard K. Bell)
BRINK, RUSSELL H., Wash., D. C. (Phy. Res. Engr., Bur. of Public Roads)
BROWN, HOWARD W., Freeport, Texas (Civil Design Mgr., Engrg. Dept., Dow Chemical Co.)
BROWN, J. GUTHRIE, Westminster, London, England (Partner, Sir Alexander Gibb & Partners)
CANEVA, BRUNO, New York, N. Y. (Sec.-Treas., Central Cement, Finishing Co., Inc.)
DABNEY, CHARLES M., Lynwood, Calif. (Mgr., Ready-mix Div., Leebrick & Fisher, Inc., Long Beach)
DAIGLE, L. E., Detroit, Mich. (Design & Super. of Structures, L. E. Daigle Co.)
DAVIDSON, JAMES W., Evanston, Ill. (Asst. Bridge Engr., Gen. Super., Chicago, Burlington & Quincy Rail Road Co., Chicago)
DAVIS, ROBERT J., Detroit, Mich. (Cons. Engr.)
DEPICOLZUANE, JOHN, Long Island City, New York, N. Y. (Struct. Engr., Vitro Engrg. Corp., N. Y., N. Y.)
DEVINCENZO, SALVATORE ANTHONY, West Roxbury, Mass. (Field Engr., Metcalf & Eddy, Boston)
DOBROWOLSKI, JOSEPH A., Sacramento, Calif. (Civil Engr., Portland Cement Assoc.)
DOMHOLT, O. S., Minneapolis, Minn. (Struct. Engr., Lang & Raugland)
DUPLESSIS, J., Montreal, Que., Canada (Plant Engr., Canada Concrete Products, Inc.)
FINKELSTEIN, ARTHUR, Brooklyn, N. Y. (Civil Engr., Marbarry Corp., New York, N. Y.)
FIRMAN, HARRY W., Portland, Ore. (Struct. Engr., U. S. Dept. of Agriculture, Soil Conservation Service)
FISCHER, CHESTER O., Decatur, Ga. (Chf. Struct. Engr., Stevens & Wilkinson, Atlanta)
FOSTER, EDWIN B., Los Angeles, Calif. (Cons. Civil Engr., Struct. Design)
FUNK, LESTER J., Bayside, N. Y. (Design Engr.)
GALEZEWSKI, STEVE, Whittier Calif. (Project Engr., Rockwin Prestr. Concrete Corp., Norwalk)
GERARD, PIERRE JOSEPH, London, England (Consultant, Cooling Tower Dept., L. G. Mouchel & Partners)
GILLENGERTEN, LAWRENCE P., Cincinnati, Ohio (Bldg. Design Engr., Const. Dept., Engrg. Div., Procter & Gamble Co.)
HAINER, JAMES ROSS, Waterloo, Ont., Canada (Engr., Ball Brothers, Ltd., Kitchener)
HALE, EVERETT P., Chicago, Ill. (Constr. Engr., Chicago Transit Authority)
HAMILTON, JAMES H., Shreveport, La. (Branch Mgr., Barrow-Agee Laboratories, Inc., Memphis, Tenn.)
HARRISON, JAMES CAMERON, Kansas City, Mo. (Struct. Consulting, James Harrison Engineering Co.)
HOLLOWAY, NEILL, Montreal, Que., Canada (Senior Engr., Racey, MacCallum & Assoc.)
HUBER, KENNETH M., Princeton, N. J. (Struct. Fieldman, Portland Cement Assoc., Trenton, N. J.)
IBARRA, JORGE HERRERA, Mexico, D. F. (Design Engr., La Consolidada, S. A.)
ISADA, NELSON M., Detroit, Mich. (Struct. Engr., Smith, Hinchman & Grylls, Inc.)
JENSON, T. B., W. Palm Beach, Florida (Vice Pres., Gee & Jenson, Cons. Engrs., Inc.)
JOHNSTON, V. R., Doncaster East, Vic., Australia (Struct. Engr.)
KLEIN, HOWARD, Sacramento, Calif. (Apprentice Instr., Sacramento Unified Schools)
KONHEIM, GEORGE, Beverly Hills, Calif. (Pres., Buckeye Constr. Co.)
KRAHL, NAT WETZEL, Houston, Texas (Struct. Engr., Walter P. Moore, Cons. Engr.)
LLERAS LLERAS, Guillermo, Bogota, Colombia (Ingeniero Civil, Improteco Ltda., Distribucion productos "Sika")
LOTT, HAMILTON, Columbia, S. C. (Exec. Vice Pres., Palmetto Quarries Co.)
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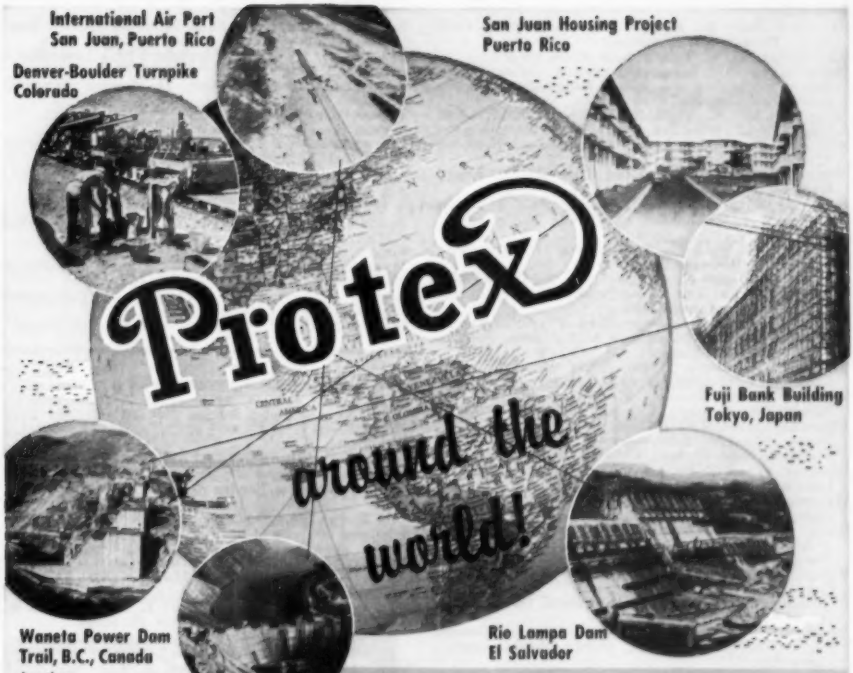

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1. The names and addresses of the publisher, editor, managing editor, and business managers are:

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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

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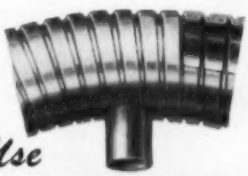

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Tools, Materials, Services

Under this heading note is made of producer literature and products of presumed technical interest to ACI users of tools, equipment, materials, accessories, and special services.

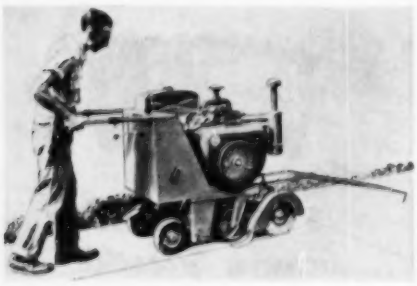
Electrification of floors

A cellular unit for electrification of reinforced concrete floors in office buildings has been developed by Granco Steel Products Co. The material is used in combination with the company's Cofar, a combined steel form and reinforcing unit for reinforced concrete floor construction on all types of buildings.

The new material has the same depth as Cofar, but has wide troughs which are capped to form cells to carry the various power, telephone, and signal circuits required in office buildings. Like Cofar, it has transverse T-wires welded to each corrugation and provides both a form and reinforcement for concrete slabs. It is produced in one-, two-, and three-cell units.—Granco Steel Products Co., 6506 N. Broadway, St. Louis 15, Mo.

Cutting saw

A concrete cutting saw that is designed to cut at any speed from 10 in. to 20 ft per min has been announced by Engineered Equipment, Inc. It uses 12 to 20-in. diameter blades by changing the guard size, and is available with 15-, 25-, and 36-hp engines, manual or self-starting.



The engine is mounted on the frame instead of the arm, which the manufacturer says prevents tilting of machine to provide better alignment of blade with cut, and counteract tendency of blade to climb out of cut. A manual screw depth setting and a foot lever for removal of blade from cut without losing depth setting are said to increase the production on cross-joint work. The saw travels in a straight line because it has a direct drive to axle instead of to the wheels.—Engineered Equipment, Inc., Waterloo, Iowa.

Bulk cement handling

A 4-page bulletin on bulk cement handling in New York harbor has been published by the Fuller Co. The bulletin describes a system of materials handling for the loading facilities of the Lehigh Valley Railroad Co.'s Jersey City, N. J., terminal. Information is offered on the system which pumps cement aboard a barge.—Fuller Co., Catasauqua, Pa.

Tunnel concreting

A booklet concerning the 12 major tunneling projects constructed in the western hemisphere in recent years has been published by The Master Builders Co. Each case history is a report of the excavating and concreting problems encountered and successfully solved on these projects. Included in the study are: (1) the Hydro-Quebec Bersimis job and its unique concrete requirements; (2) the Aluminum Co. of Canada's Kemano project with its huge underground powerhouse; and (3) the Tecolote project in California. Highway, railway, and water tunnels and their construction techniques are illustrated by photos and accompanying text.—The Masters Builders Co., 7016 Euclid Ave., Cleveland 3, Ohio

Testing equipment

A 128-page catalog released by Soiltest, Inc., describes more than 1350 items of apparatus for engineering tests of soils, concrete, asphalt, and construction materials. Included are suggested laboratory layouts with equipment lists and excerpts from ASTM and AASHO specifications.

The catalog has a section devoted to soil mechanics apparatus, the basic sampling and preparation equipment to the testing machines for triaxial, unconfined compression, direct shear, California bearing ratio, consolidation and similar tests. The concrete section is devoted to a wide variety of apparatus for compression and flexure testing, slump, mixing, molding flow, vibrating, air entrainment, volumetric measurements, curing, and cement testing.—Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill.

Fire safety standard

"Standard Types of Building Construction," NFPA No. 220, is the revised edition of a fire safety standard published by the National Fire Protection Association. The pamphlet purports to serve as a guide for those who wish to specify structural requirements withoutidetailing specific assemblies of materials. A new defin tion of noncombustibility is included. Available at $0.25 per copy.—National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass.

Block splitter

Equi-Split, a machine deriving its name from its system of self-equalizing blade pressure on the full surface of a block, is designed to eliminate breakage in splitting colored concrete block. The unit weighs about 1000 lb and makes precision splits at sizes from 1⅝ to 8 in.—Precision Machine Works, Oklahoma City, Okla.

List of American Standards

Some 275 of the 1600 ASA standards indexed in the new "List of American Standards" are in the field of civil engineering and construction. Included are codes for building and plumbing, test methods and specifications for building materials of all types, fire tests and safety precautions in construction, modular coordination, and other related items. The 56-page booklet also describes the work of the American Standards Association, and gives purchasing information for both ASA standards and those from other countries. Available without charge.—American Standards Association, 70 East 45th St., New York 17, N. Y.

Forced air heater

The Summeraire portable space heater now in production is 16 in. wide and 40 in. long, and can be fitted with flexible duct for effecting heated air flow. Auto-

matic in operation, with a completely enclosed flame, the unit delivers 120,000 Btu per hr at the rate of 950 cu ft of heated air per min. Output is up to 150 F above ambient temperature.—Clayton Manufacturing Co., El Monte, Calif.

Prestressed concrete bridge members

Plans, data, and specifications for Amdek prestressed precast concrete bridge members appear in a new booklet. Designs are all in accordance with Michigan State Highway Department specifications and Bureau of Public Roads criteria.—Lamar Pipe and Tile Co., Box A, Roosevelt Station, Grand Rapids 9, Mich.

Vermiculite plaster

Techniques of machine-applying three vermiculite products are shown in "New Horizons in Plastering," a 16-mm sound film in color recently released by the Vermiculite Institute. Machines which apply vermiculite plaster, acoustical plastic, and concrete are demonstrated on jobs ranging from small homes to skyscrapers. Fireproofing applications and vermiculite concrete spandrel wall are also shown.—Vermiculite Institute, 208 South La Salle St., Chicago 4, Ill.

Expansion-drive rivet

An expansion-drive rivet for fastening to masonry has been announced by the Southco Division of the South Chester Corp. Placed through the part to be fastened into a ¼-in. diameter hole, the rivets are secured by hitting the pin with a hammer. The pin expands the shank of the rivet.—Southco Division, South Chester Corp., Lester, Pa.

Concrete sawing blades

The Clipper Manufacturing Co. has announced additions to its line of blades for sawing green concrete. These blades are designed primarily for use in sawing control joints where corrugated cardboard strips are used to control random cracking in highway and airport construction. One blade will produce a saw cut approximately ⅜ in. wide, and the other will make a cut about 7/16 in. wide.—Clipper Manufacturing Co., 2800 Warwick, Suite 657, Kansas City, Mo.

Rock bolt

A ¾-in. steel rock bolt with a forged anchoring head and expansion shield is now available for tunnel work and general construction purposes from Republic Steel's bolt and chain division. It is capable of sustaining a 40,000 lb pull-out in hard rock. The anchoring end of the bolt has a wedge head and shield and the exposed end is roll threaded. It can be obtained in stock lengths from 2 to 8 ft, or can be made on order to any specified length.

A ready-made place of attachment for forms used in shotcreting or concreting in certain types of tunnels is provided by the projection of the threaded end of the bolt from the anchoring hole. This projection may also be used for attaching cables and other rigging.—Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio

Trade association directory

A directory of more than 2000 national trade associations and related business organizations has been published by the Trade Association Division of the Office of Technical Services, U. S. Department of Commerce. Directory gives mailing address, name and title of key executive in each organization, and organizations are indexed according to product or service field. Designated by symbols in the new directory are 950 organizations of manufacturers and 350 of distributors. The *Directory of National Trade Associations* is for sale at $0.40 per copy.—Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Concrete topping or patch

A 2-page catalog addition sheet gives information on Camp's latex concrete topping and Camp's latex quick floor patch. Product consists of a powder mix and latex liquid, which are combined to give a self-bonding patch or surface that can be applied to wet or dry concrete.—The Camp Co., Inc., 6958 South State St., Chicago 21, Ill.

Paver

Availability of a dual-drum road paver incorporating 17 major design modifications and operational changes was announced recently. Features of the paver include engine speed of 1800 rpm, hydraulic-steering brakes,

four-strand chain drive, and a 700-gal. auxiliary water tank that has been redesigned to eliminate buckling due to water surge and the possibility of welds cracking.—Worthington Corp., Harrison, N. J.

Accelerator

Manufacturer states that concrete can be placed when temperatures are as low as 15 F, using Forrer's accelerator to lower freezing point and accelerate hardening. The accelerator is said to increase strength and workability. Rust inhibitor added to the mix prevents it from affecting reinforcing steel or tools.—Forrers, 2225 North Humboldt Ave., Milwaukee 12, Wis.

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Structural Design Considerations for Pavement Joints—Subcommittee III, ACI Committee 325

Shearing Strength of Reinforced Concrete Slabs—Richard C. Elstner and Eivind Hognestad

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Earthquake Resistant Design Based on Dynamic Properties of Earthquakes—George W. Housner

Structural Analysis by Dynamic Load Parameters—James A. Cheney

Spacing of Reinforcement in Beams—S. J. Chamberlin

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Some Implications of Recent Diagonal Tension Tests—Phil. M. Ferguson

Conduction Calorimeter for Measuring Heat of Hydration of Portland Cement at Elevated Temperatures and Pressures—N. C. Ludwig and S. A. Pence

Bhakra Dam—Design and Construction Features—C. L. Handa and O. P. Chadha

An Expression for Creep and Its Application to Prestressed Concrete—Cevdet Z. Erzen

Empirical Time-Strength Relations of Concrete—Myron L. Goral

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Strength of a Concrete Slab Prestressed in Two Directions—A. C. Scordelis, K. S. Pister, and T. Y. Lin

Lining of the Tecolote Tunnel—E. R. Crocker

Theory of Stresses Induced in Reinforced Concrete by Applied Two-Dimensional Stress—Bruce H. Falconer

Some Effects of Carbon Dioxide on Mortars and Concrete—I. Leber and F. A. Blakey

Analysis of Inelastic Bending Stress in Concrete Beams—James M. Prentis

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Design Considerations for Concrete Pavement Reinforcement for Crack Control—Subcommittee IV, ACI Committee 325

Auditorium Framed with Prestressed Roof Girders—Eric C. Molke

Properties of Lightweight Aggregates and Lightweight Concretes—G. W. Washa

Structural Lightweight-Aggregate Concrete—Ralph W. Kluge

Helicoidal Staircases of Reinforced Concrete—Victor R. Bergman

Fatigure Tests of Pre-Tensioned Prestressed Beams—A. M. Ozell and E. Ardaman

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Guide for Ultimate Strength Design of Reinforced Concrete—Charles S. Whitney and Edward Cohen

Lightweight Aggregates for Concrete Masonry Units—C. C. Carlson

Insulating Concretes—R. C. Valore, Jr.

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